United States Court of Appeals

for the

District of Columbia Circuit

TRANSCRIPT OF RECORD

BRIEF AND APPENDIX FOR APPELLANTS.

IN THE
United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA.

No. 8252.

ROBERT M. ALLEN, FRIEDRICH ERNST TIMMER,
AND VEGEX INCORPORATED,
Appellants,

vs.

CONWAY P. COE, Commissioner of Patents,
Appellee.

UNITED STATES
COURT OF APPEALS FOR T
DISTRICT OF COLUMBIA
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Joseph W. Stewart
CLERK

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Appeal from the District Court of the United States
for the District of Columbia

Filed April 18, 1942

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United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA

UNITED STATES
OF APPEALS FOR THE
DISTRICT OF COLUMBIA
FILED MAY 3 - 1943
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No. 8252

Robert M. Allen, Friedrich Ernst Timmer and
Vegex, Incorporated,
Appellants,

vs.

Conway P. Coe, Commissioner of Patents,
Appellee.

PETITION FOR REHEARING.

The appellants respectfully petition for rehearing in the above case with respect to that portion of the decision which deals with the Bacon patent, for the reason that appellants are convinced that the Court, in considering the Bacon patent, failed to take into consideration the entire Bacon disclosure.

It is of course too well settled for citation of authority that in construing a patent, like any other instrument, the entire contents must be considered.

Goodyear Dental Vulcanite Co. v. *Davis,* 102 U. S. 222;
Hogg v. *Emerson,* 6 How. 437;
National Hollow Brake-Beam Co. v. *Interchangeable Brake-Beam Co.,* 106 Fed. 693.

The question with regard to any citation from the prior art is what does that publication disclose to the man skilled in the art? Had the Bacon patent stated merely that the patentee "used the spent mash for increasing the yield of yeast" (Opinion, p. 2) the patent might be regarded as perhaps suggesting the experimentation which led to the appellants' invention, but Bacon did not stop there. Instead he gives in his patent the yields obtained, and these yields, which Bacon apparently regarded as high yields, are so far below the yields that were obtained in everyday yeast manufacture at the time of filing the application before the Court as to render the Bacon process worthless for the *sole* purpose stated, namely, producing *large* yields.

The patent *as a whole* taught the prior art at the time of the application for the patent in suit that a molasses-mineral salts mash to which the Bacon formula was added gave yields much *smaller* than those obtained from the molasses-mineral salts mash *without* the Bacon formula. Hence the worker in the art familiar with the Bacon patent would be led *away* from the process developed by the appellants, rather than toward it. The development in yeast manufacture in the interval between the application for the Bacon patent and the application here in suit is parallel with the development in the airplane industry. An applicant for an airplane patent in 1918 might very well say: "I have invented a way to increase the speed of airplanes. By my invention the plane attains a speed of 150 miles an hour". An airplane designer twenty years later would certainly not consider adopting any measure whose claim to utility was based on giving the plane a speed of 150 miles an hour.

The appellants are not asking a rehearing with respect to the Court's ruling that the claims are too broad as not containing a limitation of maximum as well as minimum percentage of extract. Any objection to the wording of the claims can be cured by filing a continuing application just as a patent, once granted, may be reissued to narrow claims which are too broad. The Court's ruling, however, that the process disclosed no invention over the Bacon patent precludes the filing of a more limited continuing application.

Respectfully,

W. B. MORTON,
Attorney for Appellants.

Dated: New York, N. Y.,
April 19, 1943

Certificate.

I certify that this petition for rehearing, in my opinion, is well founded in law and fact, and is not filed for purposes of delay.

W. B. MORTON,
Attorney for Appellants.

INDEX

PAGE
Jurisdictional Statement 1
Statement of the Case 2
Statement of Points 2
Summary of Argument 3
Argument 4
The Findings of Fact 11
    Point I 12
    Points II and III 12
    Point IV 13
    Point V 15
Conclusion 16

CASES CITED

Carbide & Chemicals Corp. v. Coe, 69 App. D. C. 372 14
John H. Delaney, In re Application of, 16 U. S. P. Q. 281 14
Fleischmann Yeast Co. v. Federal Yeast Corporation, 8 F. (2d) 186 7
Gasoline Products Co., Inc. v. Coe, 66 App. D. C. 333 14
Minerals Separation, Ltd. v. Hyde, 242 U. S. 261 14
Minerals Separation v. Magma Co., 280 U. S. 400, 402 8
Minnesota Mining & Mfg. Co. v. Coe, 69 App. D. C. 217 14
Skelly Oil Co. v. Universal Oil Products Co., 31 F. (2d) 427 16
Tilghman v. Proctor, 102 U. S. 707 14

U. S. CODE CITATION

R. S. 4915 (35 U. S. C., Section 63) 1

INDEX TO APPENDIX

PAGES

Complaint for Issuance of United States Letters Patent 1

Answer to the Complaint 4

Findings of Fact and Conclusions of Law 6

Final Judgment 8

Notice of Appeal 9

Specification 10

Examiner's Statement 14

Decision of the Board 18

Transcript of Proceedings 22

Testimony of Robert McDowell Allen 23

Exhibits.

Plaintiffs' Exhibit 2 (Run Sheets) 37-38

Bacon Patent No. 1,532,858 39

IN THE

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA

No. 8252

ROBERT M. ALLEN, FRIEDRICH ERNST TIMMER,
VEGEX INCORPORATED

Appellants

vs.

CONWAY P. COE, Commissioner of Patents

Appellee

BRIEF FOR APPELLANTS

Jurisdictional Statement

The appellants filed their bill in the District Court under R. S. 4915 (35 U. S. C., Section 63) against the appellee Conway P. Coe, as Commissioner of Patents, to obtain a decree that the appellant, Vegex, Incorporated, as assignee of Robert M. Allen and Friedrich Ernst Timmer, was entitled to have a patent issued to it on the Allen and Timmer application, Ser. No. 4520, filed February 1, 1935 (Appellants' App. 1).

Statement of the Case.

The Court below (Justice O'Donoghue) after hearing the witness for the appellants held that the claims on appeal before him were unpatentable and dismissed the bill (Appellants' App. 8).

No opinion was rendered by the Court below, but Findings and Conclusions drafted by the solicitor for the Patent Office were entered by the Court (Appellants' App. 6).

Appellants thereupon appealed to this Court, filing their Notice of Appeal and Transcript on April 18, 1942 (Appellants' App. 9).

Statement of Points

Point 1.

The claims in suit define a process which differs from that of the Bacon patent in purpose and result as well as in the procedure described and the proportions of the ingredients employed (Finding of Fact No. 4).

Point 2.

Nothing was known prior to the application here in issue as to the effect of additions of distillers' mash to yeast-growing worts upon the vitamin content of the yeast (Finding of Fact No. 5).

Point 3.

It is not a fact that the Vitamin B content of yeast is proportional to the quantity of mash used in the wort (Finding of Fact No. 5).

Point 4.

The claims in issue are patentable because they define the specific procedure and proportions of ingredients which produce the unexpected results discovered by the applicants (Finding of Fact No. 6).

Point 5.

The process defined in the claims in issue involves patentable invention over the Bacon patent (Finding of Fact No. 7).

Summary of Argument

1. The applicants were the first to discover that yeast of high vitamin content could be produced from worts consisting predominantly of molasses and mineral salts.

2. The applicants were the first to discover that yeast of high vitamin content could be produced in yields comparable with the yields obtainable for yeast of low vitamin content.

3. The yeast produced by the processes of the Bacon patent is of low vitamin content and the yields asserted to be obtained are low.

4. The process defined in the claims in issue is the first to produce yeast of high vitamin content from worts containing molasses and mineral salts as the major sources of yeast nutrient.

5. The process defined in the claims in issue is the first to produce high yields of yeast which is also of high vitamin potency.

6. The claims in issue define in terms of procedure and proportions of essential ingredients the process by which the novel results are obtained.

7. There was novelty and invention in the achievement of the applicants.

Argument

The subject-matter of this application is a process of growing yeast of a particular kind, namely, a yeast having a high vitamin content. The owner of this application is Vegex Incorporated,* whose business is the production of yeast products of high vitamin content for medicinal use. The claims on appeal are limited to producing yeast of this character.

There are many varieties of yeast—bakers' yeast, brewers' yeast, and distillers' yeast—and they have been known and cultivated for their respective uses for a great many years. Baker's yeast will ferment beer, and brewers' yeast will make bread rise, but bread and beer so produced would be inferior in quality to the products produced by the same formulae but using a strain of yeast adapted for the particular purposes.

During the past twenty years a new and important use for yeast has been developed, namely, as a pharmaceutical preparation to supply the vitamin deficiency of an improper and unbalanced diet.

Dr. Allen's testimony gives a very vivid picture of the importance of this particular type of yeast for the treatment and the prevention of pellagra or other conditions arising from malnutrition. Upwards of five million pounds of dried yeast have been purchased from this company and used for that purpose.

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*By change of name now the Vitamin Food Company.

> "Q. How long have you been connected with the Vitamin Food Company?
>
> A. Since October of 1924, and in charge of it since 1928.
>
> Q. You have been president since 1928?
>
> A. Yes, sir.
>
> Q. About how much dry brewers' yeast have you distributed in the South for pellagra in that time?
>
> A. Past five million pounds" (Appellants' App. 25).

It is an important item of the work of the Public Health Service and the Red Cross, particularly in times of emergency, such as the recent Mississippi flood disaster.

> "You asked about the incipiency of this. After I came with this company I took the dry brewers' yeast which we were importing from the Bass Ale people for poultry and animal feeding. It had the hop bitterness in it, but it worked out splendidly in the pellagra field; and during the Mississippi flood Dr. Goldberger recommended it to the Red Cross. After that he came to New York and asked if we could get out enough of that yeast for the South. I said, 'I think we can.' He said, 'We have got to have it at a price that the poor can pay.'
>
> I suggested two things. One was that if it was done by Red Cross and governmental relief of course the cost would be one thing, but if it was distributed through jobbers and dealers into the South the cost would have to include their commissions. I said to him at the time, 'I would like to try to see if we cannot do this in the South. We have the Red Cross and other relief'—which, by the way, we are now doing. But I think, aside from finding a use for a refuse product in the South, frankly I hope the time will come when the South will be making its own yeast. Yeast is a food and can be put into a palatable food form. It is essential in pellagra, and I would like to see all the centers in the South finally have processes which

> will produce this yeast and not have to depend on whether you can get some from the brewers." (Appellants' App. 30).

The source of this valuable pharmaceutical product is principally dried brewer's yeast, a by-product of the brewing industry. The object of the application here in suit is, as expressed by Dr. Allen, to produce this yeast from waste material from the distilleries "at a price that the poor can pay" so that they will "not have to depend on whether you can get some from the brewers."

Dr. Allen is a pioneer in the development of yeast as a source of vitamins having the factors required for diet-deficiency diseases. It was through his work with fortified bread developed at the Ward Baking Company and his work in conjunction with Dr. Goldberger in the prevention of pellagra, that the discovery was made that yeast grown on molasses and ammonium salts—a yeast which can be grown cheaply and with high yields—was deficient in the PP factor which is essential for diet-deficiency purposes.

> "But in the bread work and in pellagra there are two outstanding instances that ammonium salts and molasses have less of the value than the all-grain-made yeast." (Appellants' App. 28)

That discovery is now recognized and the pharmacopoeia standard for pharmaceutical yeast is dried brewers' yeast (Appellants' App. 27).

Prior to World War No. I the universal practice for the commercial production of yeast was to grow the yeast on mashes of grain extract. Such yeast was no doubt high in vitamin content but at that time vitamins were little more than a laboratory curiosity. During the World War No. I, first in Europe and later in this country, there was a shortage of grain and a restriction on the use of grain, and one of the uses for which grain was restricted was the production of yeast. This led to a general experimentation to discover other food for the growth of yeast than grain. The problem was solved in Germany before it was here, and after the war was over the Fleischmann Company, which was then and still is the largest producer of yeast, purchased the American rights to certain German processes for growing yeast on a wort composed of molasses and mineral salts. A résumé of the yeast development during this period and the change in the industry from a grain yeast to molasses-mineral salts yeast is set out at some length in the case of *Fleischmann Yeast Co.* v. *Federal Yeast Corporation,* 8 F. (2d) 186. As the record there shows, the Fleischmann Company acquired the Hayduck patents there in suit in 1919, and prior to that time there had been, in this country, considerable experimentation and sporadic attempts to grow yeast without the use of grain, but the molasses-mineral salts process was not commercially established until the Fleischmann Company introduced the Hayduck process. Long prior to the date of invention of the process here in issue, however, the molasses-mineral salts process was in universal use for the commercial production of yeast, but because that type of yeast is deficient in vitamins, brewers' yeast was universally employed for pharmaceutical purposes.

As pointed out in *Fleischmann* v. *Federal, supra,* one of the principal advantages of the molasses-mineral salts process is that very much higher yields of yeast are obtained than possible with the old grain mash process.

The manufacture of yeast is an industrial process just like any other manufacturing process, notwithstanding the fact that the yeast is a living organism. In yeast manufacture, just as in any other manufacture, it is desirable to employ raw materials of low cost, to have low labor cost and to have a large output in proportion to the labor and material cost. Also, of course, it is desirable to produce a product of high quality. Except for the vitamin deficiency of the product which does not affect its fermentation properties, the molasses-mineral salts process is an outstanding improvement over the old grain process. The molasses, the ammonium chloride and calcium sulfate which are the essential raw materials, are cheap and easily obtained as compared with the old process which required the production of grain mashes by preliminary treatment of the grain. The molasses is merely diluted with water to the desired extent, the proper quantities of the mineral salts added, the seed yeast is supplied and in a matter of hours, with little attention on the part of the operator, the quantity of yeast present will have multiplied many times and substantially all the molasses and mineral ingredients will be exhausted.

The only essential equipment for the process is an open vat for the molasses-mineral salts solution and a blower to blow air through the solution to supply the necessary oxygen for the growth of the yeast. For use in any field where vitamins are not essential the grain-grown yeast can not compete with the molasses-mineral salts yeast as the cost of the raw materials—grain, barley, etc.,—is several times greater than the cost of molasses and the yield from the same quantity of grain is less than half the yields obtained from the molasses-mineral salts solution.

No one has ever been able to explain these greatly increased yields. A similar situation was well summed up by the late Justice Holmes in *Minerals Separation* v. *Magma Co.,* 280 U. S. 400, 402, where, in dismissing the conclusions of a learned expert as to what *must* take place under certain hypothetical conditions, he said: "There is no 'of course' to what nature can do except as proved by observation and experiment."

It was thus a condition and not a theory which confronted Dr. Allen and his associates when they set out to produce a yeast at a manufacturing cost comparable with the cost of the molasses-mineral salts yeast and which would nevertheless have a vitamin potency comparable with the best grain-grown yeast.

At the time of the invention here in controversy, prohibition was established in America and Dr. Allen's company was obliged to obtain all their supplies of brewers' yeast from abroad. This was a precarious source of supply for a product so essential to the treatment of malnutritional diseases, and one of Dr. Allen's purposes of pursuing the investigations which led to the invention here in issue was to develop a source of supply which was not to be dependent on the importation of a by-product from abroad. That foreign supply of brewers' yeast is of course now completely cut off. No foreign government permits the exportation of foodstuffs of any kind. With restrictions on the use of grain which now appear to be imminent in this country the domestic supply of brewers' yeast is also liable to be cut off and pharmaceutical yeast will have to be produced independently of the brewers.

Brewers' yeast is grown on malted grain, but as it is a by-product of the brewing industry the cost of the grain is charged against the beer, and consequently the brewers' yeast can be sold at a price far cheaper than the cost of the grain on which it is grown. The applicants' problem was to produce a yeast comparable to the dried brewers' yeast in vitamin potency, which could also be produced as a direct product, not a by-product, and at a cost which would permit its sale at a price comparable to that obtained for the dried brewers' yeast.

The known facts at the time of the applicants' work were (1) that high yields could be obtained with molasses and mineral salts at low cost, but the vitamin potency was low, and (2) that yeast of high vitamin content could be obtained from malt grain mashes such as used in the manufacture of beer, but that the yield was small and the cost of materials high.

Their first step was to find a cheap source of a vitamin-containing grain extract that could be used as a source of nitrogen in place of the brewers' malted barley. Distillers' slops is the liquid which remains when vinegar or alcohol is distilled from a fermented mash. It is virtually a waste product and most of it is thrown away (Appellants' App. 29). The inventors secured a quantity of this waste material and started a series of "cut-and-try" experiments, adding it in varying quantities to the molasses-mineral salts mixture. They discovered *that high yields of yeast of high vitamin potency could be obtained.* This had never been done before. They "discovered the limits *over* which you do not get the yields and *below* which you do not get the yields" of a yeast "high in full Vitamin B complex" (Appellants' App. 30). The claims of the application recite their discovery. Claim 6 is typical:

> 6. Method of producing high yields of yeast, high in baking strength and high in B Vitamin content, including the PP Factor, which consists in growing the yeast in a wort containing spent distillers' grain mash from which the alcohol has been separated in an amount sufficient to constitute not less than 28.5% by volume of the total wort.

The limitation to "not less than 28.5% by volume of the total wort" defines their discovery as to the lower limits. It was inserted in the claim to completely exclude the Bacon patent. There was no need to include the upper limit in the claims for there was no citation which disclosed the use of any larger proportion of distillers' wort. The specification accurately defines the limits within which both high yields and high vitamin potency are obtained, as a range of 20% from the exact formulae of the examples furnished.

The rejection of the claims on appeal is based solely on the Bacon patent. The application for the patent was filed in 1919 when research in the vitamin field was just beginning, also at a time before the introduction of the German molasses-mineral salts process in America, and hence before the large yields of molasses-grown yeast were known. Bacon was seeking simply to increase the yield of the molasses-grown yeast which at that time was, in this country, still in the experimental stage with yields not even equal to those customarily obtained with the full grain mash.

Bacon was aware that vitamins stimulated growth, and as yeast is a living organism, he apparently thought that vitamins added to the vitamin-deficient molasses and mineral salt, would promote *the growth of the yeast itself.* Bacon had no concern with the vitamin content of the yeast and his patent is absolutely silent on the subject. He probably at that time did not know that there was any difference in the vitamin content of the differently produced yeasts, as molasses-grown yeast was still in the experimental stage. It was not until after the molasses-mineral salt yeast was established on the market that its vitamin deficiency was discovered. Bacon's object was to increase the yield of yeast derived from a given amount of yeast nutrients to thereby increase the output of the Fleischmann Company's yeast factories.

The Findings of Fact.

No opinion was submitted by the Court below. Instead, the grounds of its decision were summarized in Findings of Fact and Conclusions of Law submitted by the solicitor for the Patent Office. We have no fault to find with Findings 1, 2 and 3 which summarize the applicant's process and the disclosure of the Bacon patent, other than to suggest that Finding 2 omits the essential characteristic of the applicants' process, namely, the production of high yields of yeast which is *also* of high vitamin content. A process which produced yeast of high vitamin content but in low yields would offer no advantage over the old grain process.

Point I

We take issue with the Court's Finding No. 4. The Bacon patent discloses no specific amount of distillers' mash. His only specific examples are concerned with milk and rice polish. Distillers' mash is merely suggested in one line of the patent, page 2, line 2, first column, as a substitute material, with no suggestions of how much to use or how to use it. Whether to use it in the same actual quantity as the rice polish or the same quantity as the milk on a dry weight basis; or in proportion to its sugar content or protein content, is left entirely to the experimenter. It is probable that Bacon's experiments were confined to the rice polish and the milk and the distillers' mash was just thrown in as one of those "prophetic suggestions" which lead to nothing but confusion. The yields given in the Bacon patent are low, little if any better than obtained with the old grain mashes and the yeast produced by his process is of low vitamin content, as conclusively shown by the appellants' feeding tests (Appellants' App. 31).

The application in suit is the first to describe any process for utilizing distillers' mash in the growth of yeast and is the first to disclose *any* method of obtaining *high yields* of yeast which are *also high* in vitamin potency.

Points II and III.

The Court's conclusion as expressed in Finding No. 5 as to what would be evident to one skilled in the art is in error on two grounds. It is not a fact that the vitamin potency of the yeast is proportional to the quantity of distillers' mash used in the wort. If there were a direct relationship between the quantity of grain employed and the vitamin potency of the yeast it would be impossible to produce a yeast having a vitamin potency equal to the brewers' yeast which is grown on a 100% grain mash without using the same amount of grain. The evidence establishes that, contrary to the Lower Court's theory, a yeast of a vitamin potency equal to dried brewers' yeast can be grown in a wort containing only 28% of distillers' mash.

The record shows, moreover, that increasing the percentage of distillers' mash significantly beyond this figure *reduces* the quantity of yield without *increasing* the vitamin potency. From the teachings of the art it would be assumed that progressively increasing the percentage of distillers' mash would progressively increase the vitamin content and at the same time progressively decrease the yield, so that at one end of the progression you would have a molasses-mineral salts process with high yields and low vitamin potency and at the other end of the progression you would have a grain process with low yields and high vitamin potency. The applicants discovered that this was not the case. That there was an intermediate range of which the preferred formula represents the optimum where the substitution of grain mash for *a part* of the molasses and mineral salts produced a yield comparable with those obtained with the molasses-mineral salts process and with *no loss* of vitamin potency. This is a valuable discovery of which there is no suggestion in the prior art.

Point IV

Finding No. 6 of the Lower Court reads as follows:

> "6. It did not amount to invention to experiment with spent distillers' mash as an ingredient of yeast-growing worts in varying amounts and discover that high yields and high vitamin potency could simultaneously be obtained by adding to the worts spent distillers' mash in the amount specified."

This finding is on its face contrary to the weight of authority. Many of the greatest inventions have resulted from the discovery of an unexpected result in the course of experimental research.

> *Tilghman* v. *Proctor*, 102 U. S. 707;
> *Minerals Separation, Ltd.* v. *Hyde*, 242 U. S. 261.

The process of the patent in suit in the first of the above cases revolutionized the soap making industry. It was based on the discovery that heating the fats to a higher temperature than formerly produced an unexpected change. The patent in issue in the second case resulted in a great improvement in the separation of ores by flotation. The discovery there was that an unexpected result was obtained when the oil used was reduced to a lower concentration than previously employed.

This Court has frequently held that processes developed in the course of research which produce a novel, unexpected and useful result involved patentable invention.

> *Minnesota Mining & Mfg. Co.* v. *Coe*, 69 App. D. C. 217;
> *Gasoline Products Co., Inc.* v. *Coe*, 66 App. D. C. 333;
> *Carbide & Chemicals Corp.* v. *Coe*, 69 App. D. C. 372.

The following decision of the Court of Customs and Patent Appeals is directly in point:

> "Where one skilled in the art, upon examining references, would be directed away from applicant's composition rather than toward modifying proportions therein set forth to produce applicant's composition, applicant's composition involved invention in changing proportions." *In re Application of John H. Delaney*, 16 U. S. P. Q. 281.

The results obtained by the applicants here were novel. No one had ever before produced *high yields* of yeast of *high* vitamin potency by *any* process. Also the result was totally unexpected and contrary to the teachings of the art and it was only because the need was great that the applicants persisted in their research notwithstanding the fact that on the basis of prior experience their efforts would result in naught.

Point V

In finding No. 7 the Lower Court holds that the process of the claims in suit is not patentable over the Bacon patent.

It is plaintiff's position that the Bacon patent fails in every requirement of an anticipating patent.

The Bacon patent contains no disclosure of any method of employing distillers' slops in the manufacture of yeast and the quantities stated of the supposed alternate ingredients do not produce *either* high yields *or* high vitamin content.

The yields stated in the Bacon patent confirm the accepted teachings of the art at the time the application in suit was filed, viz., that the addition of organic vitamin-bearing substances to the yeast growing solutions *lowered* the yield. From the Bacon disclosure it would be expected that an increase in the amount of the organic substances to the range specified in the appealed claims would *further reduce* the yield and not increase the yield.

The Bacon patent is silent on the vitamin potency of the yeast produced and as vitamin potency is not a requirement in bakers' yeast there is no basis for reading into the patent any disclosure with respect thereto.

The applicants were familiar with the Bacon patent at the time of their research work and had they given heed to it as an indication of the result to be expected they would not have proceeded with their work (Appellants' App. 33).

It was only because they knew that in the field in which they were working results were *not* predictable that they persevered and obtained ultimate success.

The Third Circuit Court of Appeals in *Skelly Oil Co.* v. *Universal Oil Products Co.,* 31 F. (2d) 427, at 431, contains a definition of the requirements of a prior art citation to constitute an anticipation of a later invention which is particularly applicable to the case at bar:

> "A patent relied upon as an anticipation must itself speak. Its specification must give in substance the same knowledge and the same directions as the specification of the patent in suit. Otto v. Linford, 46 L. T. (N. S.) 35, 44. It is not enough to prove that a method or apparatus described in an earlier specification can be made to produce this or that result. Flour Oxidizing Co. v. Carr & Co., 35 R. P. C. 457. A singularly sensible test of the rule of anticipation is given in British Thomson-Houston Co. v. Metropolitan Vickers Electrical Co., 45 R. P. C. 22, by asking the question—'Would a man who was grappling with the problem solved by the patent attacked, and having no knowledge of that patent, if he had had the alleged anticipation in his hand, have said: "That gives me what I wish?" ' "

The Bacon patent fails utterly to meet this test.

CONCLUSION

The judgment below should be reversed and a patent should be granted to appellants on the claims in issue.

Respectfully submitted,

W. B. MORTON
CLARENCE M. FISHER
Attorneys for Appellants

APPENDIX

Complaint for Issuance of United States Letters Patent

IN THE DISTRICT COURT OF THE UNITED STATES

FOR THE DISTRICT OF COLUMBIA

CIVIL ACTION No. 8820

ROBERT M. ALLEN, FRIEDRICH ERNST TIMMER, and VEGEX INCORPORATED, 122 Hudson Street, New York City,
Plaintiffs,

vs.

CONWAY P. COE, Commissioner of Patents, Washington, D. C.,
Defendant.

I. The jurisdiction of this Court depends upon the Patent Laws of the United States, this Complaint being filed under Section 4915, Revised Statutes (Comp. Stats. 9460; U. S. C. Title 35, Section 63), as amended by Act of March 2, 1927.

II. The plaintiffs, Robert M. Allen and Friedrich Ernst Timmer, are the joint inventors of the subject matter disclosed and claimed in an application for United States Letters Patent for improvements in Processes of Producing Yeast, filed by them in the United States Patent Office on February 1, 1935, Serial No. 4520.

III. The plaintiff, Vegex, Incorporated, is the sole owner of the said application Serial No. 4520 by reason of an assignment from the plaintiffs Robert M. Allen and Friedrich Ernst Timmer executed January 31, 1935 and recorded February 6, 1935 in Liber D-162, page 532 of the Transfers of Patents, in the United States Patent Office.

IV. The Board of Appeals of the United States Patent Office in a decision rendered on the 26th day of April, 1940, refused to allow four claims of said application Serial No. 4520.

V. The said four claims in said application Serial No. 4520, which the Board of Appeals of the United States Patent Office refuses to allow are as follows:

> 6. Method for producing high yields of yeast, high in baking strength and high in B Vitamin content, including the PP Factor, which consists in growing the yeast in a wort containing spent distillers' grain mash from which the alcohol has been separated in an amount sufficient to constitute not less than 28.5% by volume of the total wort.
>
> 7. Method for producing high yields of yeast, high in baking strength and high in B Vitamin content, including the PP Factor, which consists in growing the yeast in a wort consisting of sugar material, inorganic nitrogenous matter and spent distillers' grain mash from which the alcohol has been separated in an amount such that the solids contained in said grain mash are not less than the sugar content of the sugar material.
>
> 8. Method for producing high yields of yeast, high in baking strength and high in B Vitamin content, including the PP Factor, which consists in growing the

yeast in a wort consisting of a water solution of sugar material, inorganic nitrogenous salts, inorganic nutrient salts and spent distillers' grain mash from which the alcohol has been separated in an amount such that the solids contained in said grain mash are not less than the sugar content of the sugar material.

9. Method of producing high yields of yeast, high in baking strength and Vitamin content, including the PP Factor, which consists in growing the yeast in a wort consisting of water, sugar material, inorganic nitrogen salts, inorganic mineral salts, and cereal extracts containing available proteins of the character found in spent distillers' mash in an amount such that said proteins are equal to not less than 40% sugar content of the sugar material.

VI. The defendant, Conway P. Coe, Commissioner of Patents of the United States, by the aforesaid decision of the Board of Appeals of the United States Patent Office has refused and still refuses to grant Letters Patent of the United States to the plaintiffs on their said application Serial No. 4520, including said four claims recited in Paragraph V hereof.

VII. The said decision of the Board of Appeals was rendered on or about the 26th day of April, 1940, and within six months last past, and no appeal has been taken from said decision of the Board of Appeals to the Court of Customs and Patent Appeals, and no such appeal is pending or has been decided.

WHEREFORE, the plaintiffs demand that this Honorable Court authorize the Commissioner of Patents to issue to plaintiffs, Letters Patent of the United States embodying said claims 6, 7, 8 and 9, upon the filing in the United

States Patent Office of a certified copy of such adjudication, and upon compliance with the requirements of the law for such cases made and provided.

ROBERT M. ALLEN,
FRIEDERICH ERNST TIMMER,
VEGEX, INCORPORATED,
By CLARENCE M. FISHER,
Attorney for Plaintiffs,
834 National Press Building,
Washington, D. C.

W. B. MORTON,
Of Counsel.

Answer to the Complaint

To the Honorable the Justices of the District Court of the United States for the District of Columbia:

I. Defendant admits the allegations of paragraph 1.

II. He admits that the plaintiffs Allen and Timmer, claiming to be the joint inventors of certain alleged improvements in Processes of Producing Yeast, filed in the Patent Office, on February 1, 1935, an application for patent thereon, to which application Serial No. 4,520 was given. He denies that the subject matter claimed constitutes a patentable invention.

III, IV, V. He admits the allegations of paragraphs III, IV and V.

VI. He admits that by the decision rendered by the Board of Appeals on April 26, 1940, he has refused and still refuses to grant plaintiffs a patent containing any of claims 6, 7, 8 or 9 of said application. He denies that his refusal is wrongful or that plaintiffs are lawfully entitled to receive a patent containing any of said claims as it is deemed that the said claims are unpatentable in view of the following prior patent and for the reasons given in the statement of the examiner in answer to the appeal and the decision of the Board of Appeals, copies of which will be furnished at the trial:

Bacon, 1,532,858, April 7, 1925.

Profert of a copy of this patent is hereby made.

VII. He admits the allegations of paragraph VII.

W. W. COCHRAN,
Solicitor, U. S. Patent Office,
Attorney for Defendant.

November 28, 1940.

I hereby certify that a copy of this Answer was mailed to the attorney for plaintiff on November 28, 1940.

W. W. COCHRAN,
Solicitor.

Findings of Fact and Conclusions of Law

IN THE DISTRICT COURT OF THE UNITED STATES

FOR THE DISTRICT OF COLUMBIA

CIVIL ACTION No. 8820

ROBERT M. ALLEN et al,
Plaintiffs,
vs.
CONWAY P. COE, Commissioner of Patents,
Defendant.

FINDINGS OF FACT

1. This is an action under Section 4915 R. S. (U. S. C., title 35, sec. 63) in which it was sought to have the Court find that the plaintiffs, Robert M. Allen and Frederick E. Timmer, as applicants of application Serial No. 4,520, and Vegex, Incorporated, as the assignee thereof are entitled to have issued to them a patent containing claims 6 to 9, inclusive, of the said application.

2. The Allen and Timmer application here involved discloses a method of producing yeast high in vitamin B content and pellagra prevention factor, in which the yeast is grown on a wort containing 28.5% or more of spent distillers grain mash from which the alcohol has been extracted.

3. The patent to Bacon, No. 1,532,858, discloses a process of growing yeast in a wort to which a vitamin-containing material has been added. Among such materials suggested are rice polish, milk, green vegetable matter and distillers' grain mash from which the alcohol has been extracted. The amount of rice polish which it is proposed to use amounts to about seven percent of the total wort. No example is given of the use of distillers' mash and there is thus no specific statement of the amount of this material to be used. The patent makes no reference to the vitamin B content or pellagra prevention factor of the yeast.

4. The claims involved in this action differ from the process disclosed by the Bacon patent only in the amount of distillers' mash employed.

5. It was known in the art prior to the plaintiffs' development of the process claimed here that distillers' mash was a source of vitamin B and it would therefore have been evident to a skilled worker in the art that an increase in the amount of this mash in the wort would increase the vitamin B content of the yeast.

6. The specific proportions of distillers' mash recited by the claims here presented involve merely the selection of the amount found suitable for giving the desired amount and type of yeast.

7. The processes recited in the claims here involved do not involve invention over the disclosure of the Bacon patent and are not patentable.

CONCLUSIONS OF LAW

1. Plaintiffs are not entitled to a patent containing any of claims 6 to 9, inclusive, of application No. 4520.

2. The Bill of Complaint should be dismissed as to all the claims involved.

DANIEL W. O'DONOGHUE,
Justice.

Approved as to form:

Clarence M. Fisher,
Attorney for the Plaintiffs.

Final Judgment

IN THE DISTRICT COURT OF THE UNITED STATES

For the District of Columbia

Civil Action No. 8820

Robert M. Allen et al,
Plaintiffs,
vs.
Conway P. Coe, Commissioner of Patents,
Defendant.

This cause having come on to be heard and having been tried in open court and argued by counsel for the respective parties upon the pleadings and proofs adduced and submitted to the Court, It is ADJUDGED this 20th day of March, 1942, that the complaint in this case be, and the same hereby is dismissed with costs against the plaintiff.

DANIEL W. O'DONOGHUE,
Justice.

Approved as to form:

Clarence M. Fisher,
Attorney for Plaintiff.

Notice of Appeal

IN THE DISTRICT COURT OF THE UNITED STATES

For the District of Columbia

Civil Action No. 8820

Robert M. Allen et al,
Plaintiffs,
vs.
Conway P. Coe, Commissioner of Patents,
Defendant.

Notice is hereby given that Robert M. Allen, Frederick E. Timmer and Vegex, Incorporated, plaintiffs above named, appeal to the United States Court of Appeals for the District of Columbia from the final judgment entered in this action on March 20, 1942.

CLARENCE M. FISHER,
834 National Press Bldg.,
Washington, D. C.,
Attorney for Allen et al.

April 18, 1942.

Copy to:

W. W. Cochran,
Solicitor, United States Patent Office,
Washington, D. C.

Specification

SPECIFICATION
of
UNITED STATES PATENT APPLICATION
of
Robert M. Allen et al
for
PROCESSES OF PRODUCING YEAST

Serial No. 4520, Filed February 1, 1935

The invention relates to the use of the soluble nitrogen from grain, remaining in the spent mash from the distillery, in combination with sugary material, inorganic forms of nitrogen and other salts so as to produce high yields of yeast high in baking strength and very high in the B Vitamins, including Vitamins B_1, B_2(G).

The yeast produced by our improved process possesses a high (PP)—that is, prevention of pellagra—Factor, and also a high (PA)—prevention of anemia—Factor. Whether the components of the yeast which make it effective for the prevention of these two pernicious diseases is solely the high B_2(G) Vitamin content, is not fully understood. Certainly a high B_2(G) Vitamin content is essential, but whether there are other factors the presence or absence of which would render the same content of B_2(G) Vitamin more or less efficacious, is not entirely settled. The so-called (PP) Factor and (PA) Factor are measures of the vitamin potency in terms of the effect produced, rather than in terms of a quantitative measurement, and these expressions are used in this specification and in the claims to not exclude any of the B Vitamin constituents however they may be designated, which contribute to the potency of the yeast for the prevention of pellagra and anemia.

The discovery that brewers' yeast, properly dried, equals or surpasses wheat germ in Vitamin B_1 potency, together with the discovery that it and its autolyzed and condensed extracts are the most potent of the known sources of Vitamin B_2 or Vitamin G and the other known B Vitamins, including the PP Factor and the PA Factor makes it important to produce large yields of such yeast for sale at a food price.

Small yields, only, are had at the brewery. Being a by-product it has been and is economical. But to be potent in all of the known B Vitamins the beer must be brewed from a malted grain mash. In America, corn sugars are much used, instead of the all grain in the mash, and the by-product yeast is considerably lower in B Vitamin strength.

The importance in the food supply and for therapeutic use of such a yeast is illustrated from the records of the work of the U. S. Public Health Service in pellagra.

Alcohol is distilled from a mash consisting of molasses, ammonium salts and other mineral salts. Bakers' yeast is, in its larger quantities, made from a similar mash. Corn and barley cannot compete with the low costs from such media. In the production of alcohol the starch in the grain and its conversion into fermentable sugar is all-important. In the production of yeast the nitrogen is the important constituent. The still lifts off the alcohol produced from the sugars converted from the starch, leaving the soluble nitrogen behind. In many distilleries where grain was once used the unsoluble grain portion is sieved out and the soluble nitrogen, rendered soluble from the grain during the long fermentation process, has gone into the streams or sewer. If the whole is dried it has sale at only close feed prices.

Processes for the use of spent distillers' mash in the growth of yeast have been described, but without economical operation, as compared with modern methods in which ammonium salts and molasses form the main constituents of the wort, and which latter produces yeast of but a low Vitamin B value.

We have discovered a new and economical way which enables us to produce a yeast using the soluble nitrogen from a spent grain mash so as to get a high yield of yeast with strong bread leavening value and high in all of the B Vitamin group, including the PP and PA or "prevention of anemia", Factors.

Typical examples of how our process is operated are given as follows: a spent grain mash from which the unsoluble grain has been filtered is used. The average analysis of such spent mash is total solids—6.35%, ash—0.303%, protein (6.25)—1.75%, phosphorus (P_2O_5)—0.41%, calcium (Ca)—0.015%. The filtered mash is mixed with other ingredients in proportion, as follows:

No. 1	*No. 2*
75 grams Brown Sugar	125 grams Molasses (beet)
1 gal. filtered mash	1 gal. filtered mash
1 gal. Water	1 gal. Water
12.5 grams Ammonium Sulphate	12.5 grams Ammonium Sulphate
12.5 grams Calcium Phosphate	12.5 grams Calcium Phosphate
½ gram Magnesium Sulphate	½ gram Magnesium Sulphate
½ gram Potassium Sulphate	½ gram Potassium Sulphate
7.5 grams Seed Yeast	7.5 grams Seed Yeast
Fermented 12½ hours	Fermented 12½ hours
Temperature — 80° F. at start, 85° F. at the end.	Temperature — 80° F. at start, 85° F. at the end.
Yield — 213 grams compressed yeast	Yield — 223 grams compressed yeast

The areation should be according to good practice for yeast growth.

The process has been practiced in worts containing forty-six times the amount of each ingredient given herein and with the same high yield. We have made quantities of mash according to the usual good practice for the production of mashes for distilling. We have made these mashes out of malted grain, distilled off the alcohol and used the soluble part of the spent mash with the proportions of other ingredients as herein stated and with the same results in yield.

We have found that the proportion of the spent mash has a relationship to yield as, for example, 100 grams of beet molasses with a gallon of the spent mash gives high yields, whereas 100 grams of molasses with one-half a gallon of the spent mash, the other ingredients being the same, gives approximately one-half the yield.

Baking tests with this yeast show around 20% more volume in the loaf than if obtained from fresh, compressed yeast furnished to bakers. The feeding tests with animals, the albino rat, show much higher than with standard yeast furnished to bakers and comparable with the best dried brewers yeast which is widely used throughout the South for the relief and prevention of pellagra, because of the high potency in what Dr. Goldberger, the discoverer, named the "PP Factor".

We do not confine ourselves to the proportions in the typical examples of practice given, nor do we confine ourselves to the spent distillers' wort. We have found that the molasses can be varied within a range of 20% and the amount of spent wort varied within the same range. So, too, we have found that an extract from cereals or cereal by-products or from soy beans, extracted otherwise than by fermentation and containing approximately the same available nitrogen and minerals contained in the spent distillers' mash, can be used in the same proportions and with the same results in the practice of the process.

WE CLAIM: See Examiner's Statement (Appellants' App. 14).

Examiner's Statement

Park/hm Paper No. 14

Mailed Aug 11 1938

DEPARTMENT OF COMMERCE

U. S. PATENT OFFICE

Washington, D. C.

In re application of ROBERT M. ALLEN et al.

Ser. No. 4520. Filed Feb. 1, 1935.

For Processes of Producing Yeast.

BEFORE THE BOARD OF APPEALS ON APPEAL

This is an appeal from the rejection of claims 6 to 9 (all the claims now in the case).

The claims on appeal are reproduced as follows:

> 6. Method for producing high yields of yeast, high in baking strength and high in B Vitamin content, including the PP Factor, which consists in growing the yeast in a wort containing spent distillers' grain mash from which the alcohol has been separated in an amount sufficient to constitute not less than 28.5% by volume of the total wort.
>
> 7. Method for producing high yields of yeast, high in baking strength and high in B Vitamin content, including the PP Factor, which consists in growing the yeast in a wort consisting of sugar material, inorganic

nitrogenous matter and spent distillers' grain mash from which the alcohol has been separated in an amount such that the solids contained in said grain mash are not less than the sugar content of the sugar material.

8. Method for producing high yields of yeast, high in baking strength and high in B Vitamin content, including the PP Factor, which consists in growing the yeast in a wort consisting of a water solution of sugar material, inorganic nitrogenous salts, inorganic nutrient salts and spent distillers' grain mash from which the alcohol has been separated in an amount such that the solids contained in said grain mash are not less than the sugar content of the sugar material.

9. Method of producing high yields of yeast, high in baking strength and Vitamin content, including the PP Factor, which consists in growing the yeast in a wort consisting of water, sugar material, inorganic nitrogen salts, inorganic mineral salts, and cereal extracts containing available proteins of the character found in spent distillers mash in an amount such that said proteins are equal to not less than 40% sugar content of the sugar material.

The art relied upon is:

Bacon, 1,532,858 April 7, 1925

DESCRIPTION OF THE ALLEGED INVENTION

This application relates to a method for producing high yields of yeast, high in baking strength and high in vitamin B content, including the PP factor. The latter factor was discovered in dried brewer's yeast by Dr. Joseph Goldberger, known for his work in the prevention of pellagra, and so named by him to indicate its pellagra preventing function. Applicants' process comprises growing yeast in a wort containing spent distiller's grain mash from which the alcohol has been separated, a water solution of sugar material and inorganic nutrient salts. A cereal extract containing available proteins of the character found in spent distiller's mash may be used in place of the latter mash.

REJECTION OF THE CLAIMS

All the claims are rejected as lacking invention over the patent to Bacon which relates to the manufacture of yeast comprising growing yeast in a wort containing spent distiller's mash from which the alcohol is removed or cereal extract (extract of rice polish), a water solution of sugar material, and inorganic nutrient salts. The reference discloses that both the spent mash and cereal extract possess relatively large quantities of vitamins and that the addition of these vitamin-containing materials results in a very marked effect upon the yeast produced, such as increased yield, and strong, durable cell structure. The spent mash and its relationship to other vitamin-containing materials is disclosed particularly in page 1, line 96, to page 2, line 5 of the reference.

Applicants' process differs from the Bacon process only in the *percentage* of spent mash used (expressed in claim 9 in terms of protein content). The position is taken that these percentages are not patentably critical. The original disclosure contains only a single statement relating to percentage or proportion of spent mash in the wort. This statement, page 6, "the proportion of the spent mash has a relationship to yield," can hardly be considered as critical—in the sense now under consideration, i. e., productive of either an unusual or unexpected result. The patent to Bacon discloses the *same* relationship, page 2, lines 48-64, and lines 86-88. Thus it is clear that high yield of yeast due to addition of vitamin-containing materials to a yeast wort is not a novel result. The change in proportion of spent mash to total wort proposed by applicants would then not amount to invention. In re Dreyfus, 22 C. C. P. A.

(Patents) 830, 453 O. G. 961; Greene Process Metal Co. v. Washington Iron Works, 30 U. S. P. Q. 295.

Applicants were given the opportunity to present evidence indicating the criticality of the percentage of spent mash employed by applicants. An affidavit by Nathan M. Cregor was received showing results obtained by experiments conducted in accordance with the Bacon patent formula. No significance was attached to this affidavit, however, since the experiment reported therein did *not* include the use of *spent mash* as disclosed in Bacon. Subsequently Robert M. Allen, a co-applicant, submitted an affidavit that spent mash had been tried in accordance with the Bacon process, but that low yields of yeast were obtained as compared with applicants' process, i. e., 59% yield as compared with 200% yield. However, it is first pointed out that yields of yeast amounting to from 300 to 400% are known in the art. Secondly, applicants' increased yield over the reported Bacon process yield is due to the utilization of an amount of spent mash *greater than* that used in the Bacon process. Since Bacon teaches that it is the spent mash that is responsible for the improved yeast, including increased yield, it would be expected that increasing the amount of spent mash would further the improvement disclosed in Bacon.

There remains for consideration the significance of the expression "PP factor" recited in the claims on appeal. The Bacon patent refers to vitamin content of the spent mash, but not in terms of *PP factor* (the terminology applied by Dr. Goldberger). In the original application applicants considered the expression of *PP factor* to be the same as vitamin B_2 or vitamin G. Whatever the *PP factor* and its relationship to the B vitamins may be, it is clearly immaterial in so far as the patentability of these claims is concerned. The spent mash is apparently the source of the vitamins including the *PP factor*. Since both applicants and Bacon are using the same vitamin source whatever vitamin enrichment results in applicants' process would also result in the Bacon process. It is well settled that patentability may not be predicated upon scientific explanations or discoveries of new properties of old substances. In re Ebert et al, 19 C. C. P. A. (Patents) 1087, 57 F. (2d) 356, 1932 C. D. 327; In re Langdon, 22 C. C. P. A. (Patents) 1245, 1935 C. D. 609, 77 F. (2d) 920; In re James, 23 C. C. P. A. (Patents) 1124, 83 F. (2d) 313; Leamon v. Eley, 24 C. C. P. A. (Patents) 932; In re Newton et al, 25 C. C. P. A. (Patents) ——, 37 U. S. P. Q. 541.

It is considered that all the claims are properly rejected on the art and for the reasons above set forth, and it is respectfully submitted that this rejection should be sustained.

Respectfully submitted,

Acting Examiner, Div. 63.

Decision of the Board.

Appeal No. 27,647 MM
Hearing:
April 8, 1940

IN THE UNITED STATES PATENT OFFICE

BEFORE THE BOARD OF APPEALS

Ex parte ROBERT M. ALLEN and
FREDERICK E. TIMMER

Application for patent filed February 1, 1935, Serial No. 4520. Processes of Producing Yeast.

Messrs. PENNIE, DAVIS, MARVIN & EDMONDS for applicants.

This is an appeal from the decision of the examiner finally rejecting claims 6, 7, 8 and 9.

The following claim is illustrative:

6. Method for producing high yields of yeast, high in baking strength and high in B Vitamin content, including the PP Factor, which consists in growing the yeast in a wort containing spent distillers' grain mash from which the alcohol has been separated in an amount sufficient to constitute not less than 28.5% by volume of the total wort.

The reference relied upon is:

Bacon	1,532,858	. April 7, 1925

The invention relates to a method for producing yeast. Applicants desire to provide a method by which they will obtain a high yield of yeast, and a yeast high in baking strength, and high in B vitamin content including the PP factor. The process comprises growing yeast in a wort consisting of sugar material, inorganic nitrogenous matter and spent distillers' grain mash, from which the alcohol has been separated.

The only reference cited is the Bacon patent. The patentee states that he has discovered that a large yield of yeast can be obtained if he makes up an artificial nutrient solution comprising sugar material, suitable nitrogenous substances and relatively small amounts of inorganic yeast nourishing salts and adds to this solution certain other materials which carry a relatively large portion of vitamin containing substances and which have been derived from a relatively inexpensive extraneous source. Among the sources mentioned by the patentee are "rice polish", milk, green vegetable matter (such as grass), extracts of yeast, etc. The patentee states that "rice polish" is obtained in large quantities when rice is being hulled and polished while preparing it for food, and it contains an abundant quantity of the vitamin substances essential for the present purpose. The description then adds—

> "The same substances are found in comparatively large quantities in the *spent liquors* finally escaping as waste *after fermentation caused by yeast* or by other micro-organisms and after the alcohol has been removed."

The examiner apparently interprets the above quotation as disclosing the use of the equivalent of *spent distillers grain* mash in the nutrient solution for the growing of yeast.

Applicants state on the last page of their brief in regard to the above quotation that spent distillers' mash such as used by the applicants would come within the scope of this description from the Bacon patent, but so also would the waste liquors from the manufacture of alcohol by the fermentation of molasses and perhaps also the waste liquors from vinegar manufacture. They state that all of these various materials are not equivalents in vitamin content. Hence they argue that the disclosure in the Bacon patent is not so definite as to necessarily teach the invention involved in the claims.

Prior to developing the present invention, applicants state that the first method of producing yeast was to grow it on grain mash. All of this grain yeast had high vitamin potency but gave a low yield. About the time of the World War a method of producing yeast was developed by using molasses and inorganic salts. This yeast had a low vitamin potency but gave a high yield. Applicants tried to improve on both of these methods so as to develop a method which gives a yeast of the same high potency as all grain yeast and which also gives a high yield.

Although the Bacon patent contains a disclosure of a method which may be interpreted to set forth the invention covered by the appealed claims, applicants point out that Bacon does not set forth that a yeast is obtained of as high potency as all grain yeast and therefore argue that Bacon does not fully disclose the invention.

It seems to us that Bacon by referring to substances found in spent liquors finally escaping as waste *after the fermentation caused by yeast* unquestionably refers to substances found in distillers' grain mash. It is the practice in all beer making processes to employ grain mash and ferment it with yeast. Any one reading this disclosure in the Bacon patent would naturally infer that it refers to grain mash such as is found in beer making processes. At least it would be the first suggestion obtained by any one reading the patent. It can hardly refer to vinegar manufacture as yeast is not ordinarily used for this purpose. The fact that Bacon did not state that the yeast will have a high potency is not fatal to his disclosure. As long as Bacon describes the necessary steps by which yeast having a high potency is obtained, the disclosure is deemed sufficient. When the steps of the Bacon patent are carried out a yeast of high potency is necessarily obtained.

The claims on appeal specify the proportion of the spent mash used. The examiner did not consider such proportion critical and applicants do not appear to strongly urge that it is. It apparently would be obvious to employ a large proportion of spent mash if desired because Bacon teaches that it is the spent mash which is responsible for the improved yield. We have carefully considered applicants' brief but are unable to find that the claims are patentable.

The decision of the examiner is affirmed.

40 days—June 13, 1940
and
6 months—Oct 26, 1940

HENRY VAN ARSDALE)
Assistant Commissioner)
)
F. P. EDINBURG)Board
Examiner-in-Chief) of
)Appeals
J. W. CLIFT)
Examiner-in-Chief)

April 26, 1940

Messrs. Pennie, Davis, Marvin
& Edmonds,
165 Broadway,
New York, N. Y.

Transcript of Proceedings

IN THE DISTRICT COURT OF THE UNITED STATES

FOR THE DISTRICT OF COLUMBIA

CIVIL ACTION No. 8820.

ROBERT M. ALLEN, FREIDRICH ERNST TIMMER, VEGEX, INCORPORATED, 122 Hudson Street, New York City, N. Y.,

Plaintiffs,

v.

CONWAY P. COE, Commissioner of Patents, Washington, D. C.,

Defendant.

Washington, D. C.,
Monday, February 16, 1942.

The above-entitled cause came on for trial before Associate Justice Daniel W. O'Donoghue at 11:12 o'clock a. m.

APPEARANCES:

On behalf of the plaintiff: C. M. FISHER, W. B. MORTON.
On behalf of the defendant: E. L. REYNOLDS.

EVIDENCE ON BEHALF OF THE PLAINTIFF

Thereupon—

ROBERT McDOWELL ALLEN was called as a witness on behalf of the plaintiff and, being first duly sworn, was examined and testified as follows:

> The Assistant Clerk: State your full name, please.
>
> The Witness: Robert McDowell Allen.
>
> Mr. Morton: I would like to offer in evidence as Exhibit 1 the file wrapper which I handed up to your Honor.
>
> (File wrapper was marked Plaintiffs' Exhibit No. 1 and received in evidence.)

Direct Examination by Mr. Morton:

Q. Doctor Allen, what is your present position? A. President of the Vitamin Food Company.

Q. The Vitamin Food Company is the owner of this application here before the court? A. It is.

Q. You are also one of the joint inventors, are you not? A. I am.

Q. Who are the other two—Mr. Timmer and Mr. Crager? A. Mr. Crager was our chemist and a director of what we call our research production department. Mr. Timmer was in charge of the production of the factory and an expert in yeast.

Q. Crager is now dead? A. Yes, sir.

Q. What is the business of the Vitamin Food Company? A. It is engaged principally in the selling of yeast extracts, and more largely in furnishing dry brewers' yeast for pellagra.

Q. How long have you been connected with the Vitamin Food Company? A. Since October of 1924, and in charge of it since 1928.

Q. You have been president since 1928? A. Yes, sir.

Q. About how much dry brewers' yeast have you distributed in the South for pellagra in that time? A. Past five million pounds.

Q. How long have you been interested in the production of products of high vitamin potency? A. I had charge of the pure food work in Kentucky for some twelve years, when it was a division of the experiment station, and I came East on a year's leave of absence which continued with the old Ward Baking Company. The principal thing was the feeding of yeast in the dough-batch and then applying that, getting together the knowledge to establish our own yeast production; but particularly the building up of a nutritional balanced loaf of white bread. George S. Ward had had that as his ambition from boyhood days. Those were the three main lines that I undertook for the Ward Baking Company—the growth of yeast in the dough-batch; the growth of yeast in the factory for baking purposes, and building up a nutritional balanced loaf of white bread.

Q. You have had other experience in the growing of yeast for bakers' yeast in bread manufacture? A. Yes.

Q. What is the usual process now in vogue for growing bakers' yeast? A. First, you assemble your materials. That can be one of two things. If you are using grain you cook your corn and add your malt to it. After cooking it the enzymes of the malt will convert starch into maltose, because the yeast plant can use the maltose and cannot regularly use the starch. After doing that, you bring it to the proper PH, probably by acidfying it a little and straining it, if it is for whiskey distilling. Then you pump the whole thing over into the fermentation tank, put in your seed yeast and let that remain.

If you are producing yeast for baking, the fermentation is considerably less, because you do not want to carry it to the point of producing too much alcohol.

After the yeast has been fermented or grown in the tank, it is pumped over and separated. There is a separator that takes out the yeast and throws the water to one side, and that is further filtered and is finally made into what we know to be the three-cent yeast cake or the bakers' yeast, and it is made up and put out.

If you are using molasses and ammonium salts you discard the grain and cooking of it; and if you have black strap molasses you probably clarify it. One of the best known means is sodium silicate, to take out part of the unnecessary and obnoxious residue. You put that into your tank, add your ammonium salts, your calcium phosphate, your calcium sulphate, potassium phosphate, and so on, a standard mineral salt mixture, and you grow that for 13 hours and you have your yeast.

Q. How do you measure the yield of the yeast? What is the accepted method? A. One of the ready methods we have now is based on the molasses; and since sugar is about 50 per cent. of the molasses, your yield is based on the sugar content of the molasses, about 50 per cent.

Q. What are customary yields of yeast with the molasses and salt mixture process? A. We have today in our own work up to 200 per cent. based on the sugar content.

Q. The yeast is not measured on the dry basis. That is with the standard amount of moisture? A. That is standard in the process; yes, sir.

Q. You have also grown yeast commercially by the grain process that you have just described, have you not? A. Yes, sir.

Q. What were customary yields in that process? A. From 30 to 40 per cent., sometimes as high as 50, based on the corn.

Q. That is measured on the amount of corn which served to make the grain mash? A. Yes.

Q. As regards vitamin potency of the yeast, what is the principal vitamin in the yeast? A. It depends on what it is grown in.

Q. Take the grain yeast. A. For the grain yeast originally the discovery was called Vitamin B. That was by Funk. Then McCullom and others came along and separated them, and the part which was affected by heat was called B_1, and that which was heat-resisting was called B_2, in this country and abroad for some time. Then, later, when Goldberger discovered what he called the PP factor, the pellagra preventive factor, the American Society of Biological Chemists had a committee on nomenclature, and they decided it might be better, instead of calling it B_1 and B_2, to call the heat-affected B_1. That, by the way, is made up of several factors. Thiamin is now included as B_1. It is only part of B_1. Since Goldberger's PP factor seemed to be substantially the B_2 or heat resisting part of B_1, they called that G.

Q. For Dr. Goldberger? A. I would take it, for Dr. Goldberger.

Q. He was head of the Public Health Service? A. No. He was head of that branch of the Service that had been investigating pellagra. Since that time there have been as high as 14 parts carved out of the B vitamins, but as yet no assembly of the parts that have been carved make the whole. But the standard in the laboratories throughout the world and in the United States Pharmacopoeia is dry grain yeast or brewers' yeast.

Q. How does the vitamin potency of ammonium salts and molasses yeast compare with that of dry brewers' yeast? A. If I may use an illustration, in working on the Ward white bread vitaminizing we used wheat germ extract. Wheat germ is substantially high in all B vitamins, but not as high as grain yeast in the B_2 group. Milk, however, made up that deficiency in the loaf. That loaf went out, by the way, and it was fed to many thousands of under-nourished children with only one change in the diet.

Since we established the yeast factory the question was about the use of dry yeast.

Q. As a substitute for the wheat germ? A. Yes, sir; as a substitute for the wheat germ. Yeast made in the laboratory from ammonium salts and molasses was used, and that made in the laboratory from grain was used, and the grain yeast was in every way a better growth value.

At that time in the South Dr. Goldberger had found yeast the richest source of his PP factor. We had worked with him in Kentucky surveying diets when he had a theory that it was a disease due to diet deficiency. I had taken him wheat germ extract. He then took up dry brewers' yeast. Later, when I came with the present company, I found a very economical supply and took it down to him. But in the bread work and in pellagra there are two outstanding instances that ammonium salts and molasses have less of the value than the all-grain-made yeast.

Q. Is it or is it not true that the ammonium salts and molasses yeast is not used or not recommended for pharmaceutical use? A. Well, you can put it the other way. The brewers' yeast is now vogue for pharmaceutical yeast.

Q. Have you conducted comparative feeding tests with ammonium-molasses yeast and brewers' yeast? A. We have, as I have just described, in bread work and since.

Q. In your laboratory since? A. Yes.

Q. Will you tell us what part you had in the invention of the application here before the court? Just relate the circumstances of the beginning of that work. A. It had been a matter of interest since, in Kentucky, when we stopped the feeding of the swill, as I called it, to dairy cattle, in its liquid form. They chained the cattle up and kept them there all winter. The liquid slop, while it fattened them, had them continually in a state of liquid diarrhetic manure. We stopped that, and with so-called milk and diphtheria control in the State we cut down the amount of little white coffins going to the cemetery, just about a half. Always in my mind had been, Here is this refuse. The mash is dumped into the still, and after they take the alcohol out they sieve out the undigested part of the grain and the rest goes into the sewer or, where there is no sewer, into the creeks. Always law suits. Where they have cattle feeding it is taken for that, and where they have no cattle feeding it is not. Always it had been in my mind that here was a valuable food source, but everywhere waste.

I was going through the Heinz vinegar distillery in 1931 with the late Mr. Muller, vice president. He supported us in the fight for the pure food law, morally. I asked him what he was doing with the residue from the still. It was the same story. They sieved out the undigestible parts. I asked him if he would arrange to send us some ten-gallon milk cans by express. He was glad to, and did. When I got back to New York, Crager, who had been with us as a youngster in the pure milk work, and Timmer—we called them in. There was the old Vienna process. They did not get good yields. We had, I think, at the time some 8,100 reports on yeast, and all the known yeast patents, including Bacon's. I remember very distinctly that Bacon tried it. He tried rice polish. His patent says distillery slops; and he was only getting about one third or one-fourth of the yields. I said, "Suppose you do it: can you afford to make yeast with such low yields?"

One thing in Bacon's patent was the relation of the ammonium salts to the sugar. We considered using several times more ammonium salts to the sugar than Bacon had used, as a tryout. Obviously the first question was, Well, suppose we use more? We used more, but we did not get the results, and that stumped us. What was the matter? What was the theory? Why, when we put in the larger quantity, did we not get better yields? In other words, if Bacon had made a basic discovery, possibly low yields were based on the fact that he was not using enough. We would use more. Well, we used more. We used a gallon and a half of wort to one-half gallon of water, and did not get yields. Then we struck on a gallon of wort to a gallon of water, and we got them the yields that are cited in the application. We went on and got down to a gallon and a half of water and a half gallon of wort, and the yields fell down. We discovered the limits over which you do not get the yields and below which you do not get the yields, but, according to feeding tests, a yeast that was high in full vitamin B complex.

Q. You say you were familiar with the Bacon patent at the time you started this work? A. Yes, sir. As a matter of fact, had we followed the Bacon patent we would not have gone on with the work. The yields were too low.

You asked about the incipiency of this. After I came with this company I took the dry brewers' yeast which we were importing from the Bass Ale people for poultry and animal feeding. It had the hop bitterness in it, but it worked out splendidly in the pellagra field; and during the Mississippi flood Dr. Goldberger recommended it to the Red Cross. After that he came to New York and asked if we could get out enough of that yeast for the South. I said, "I think we can." He said, "We have got to have it at a price that the poor can pay."

I suggested two things. One was that if it was done by Red Cross and governmental relief of course the cost would be one thing, but if it was distributed through jobbers and dealers into the South the cost would have to include their commissions. I said to him at the time, "I would like to try to see if we cannot do this in the South. We have the Red Cross and other relief"—which, by the way, we are now doing. But I think, aside from finding a use for a refuse product in the South, frankly I hope the time will come when the South will be making its own yeast. Yeast is a food and can be put into a palatable food form. It is essential in pellagra, and I would like to see all the centers in the South finally have processes which will produce this yeast and not have to depend on whether you can get some from the brewers.

Q. Did you in the laboratory of the Vitamin Food Company, with your associates, ever try out the specific examples of the Bacon patent? A. We did.

Q. What did you get as to yield? Do you have any of those Bacon runs with you? A. I think I have. This (indicating) is one series of five. Later there were eighteen; but these are typical (handing a document to Mr. Morton).

> Mr. Morton: This is a record of runs made with the Bacon rice polish example, February 9 and February 10, 1937.
>
> You say these are typical of others?
>
> The Witness: There were 18 others run later.
>
> Mr. Morton: I offer this in evidence, if the Court please.
>
> (Sheet showing series of runs was marked Plaintiffs' Exhibit No. 2 and received in evidence.)

By Mr. Morton:

Q. What yields does Bacon claim in his patent? A. He starts out with 6,500 pounds of molasses and he gets from 2,100 to 2,800 pounds of compressed yeast. In our own application we got twice that yield on molasses, from one half to twice.

Q. With what process? A. With the process in the application.

Q. Those examples in the specifications were taken from your actual records, were they not? A. They were.

Q. Your results as to yield when you tried out this Bacon patent were short in the order that he describes here? A. They were. As I say, we ran these five and then later I had one of the very good technical young men run out eighteen more of them, and all confirmed about the same. He confirmed our results and we confirmed Bacon's. I think you can take the two sets of runs as having been well confirmed.

Q. Did you ever conduct any feeding tests with yeast produced by the Bacon rice polish process? A. We did.

Q. What did those feeding tests show as to the vitamin potency of the yeast as compared with dry brewers' yeast? A. Low. That might have been expected, though. No longer is rice polish regarded as a good source of any except the thiamin factor in the B complex.

Q. Did you find in your study of the Bacon patent at the time you commenced your experiments any suggestion that the rice polish or other vitamin-containing materials would add to the vitamin content of the yeast? A. Not directly. At the time we considered the whole thing. There is no suggestion in the patent that it would increase. Bacon had the idea, which at that time had been announced by others, that the addition of particularly the B vitamin would increase the yield of the yeast. Quite a little work had been done. Whether the observations went to increasing fermentation rather than yield is a question. But Bacon was seeking to get a higher yield on the ammonium salt-molasses yeast, and he got some increase. I think he got his increased yield with the rice polish as a buffer, because the B vitamins are locked up in the nitrogen, and once that is digested it frees them. Just soaking wheat or the rice polish in water for four hours, with no salt additions or acid additions or enzyme additions would yield but very little. As to what increase Bacon got, the question in my mind is whether or not it was experimental error or what not. But let us assume that he got an increased yield. I take it that he got it in buffer action, in other words, modifying the acidity that he knew at that time affected yeast yields.

Q. Do you know who is responsible for the development of the process which is now used in getting yields in the order of 200 per cent.? A. Haydock and a number of others. Haydock was the head of the Berlin Institute of Fermentation, and he took the work of Henneberg and Coscowicz, who had taught that neutralizing would prevent the acidity from ammonium sulphate inhibiting the growth of the yeast after the acidity originally had been freed from the ammonium salts so far by the growth of the yeast, and he took that knowledge and developed a process by which he got a very large yield by using their limit of free ammonium or soda to neutralize.

Q. Those patents came along, I believe, in 1920, did they not? A. Yes, sir.

Q. Prior to that time the yields such as Bacon speaks of here were about all they were getting? A. There was no production in Bacon's time of yeast with ammonium-molasses-salts. It was experimental work, at that time. Do not misunderstand me. Bacon was director of the Mellon Institute, and I regard him as one of the first in the country.

Q. That is, at the time of the Bacon patent they were endeavoring to develop processes to do away with the use of grain in the manufacture of yeast? A. Yes.

Q. And that problem was ultimately solved by Haydock and his German associates. Is that correct? A. Yes, sir.

Mr. Morton: You may take the witness.

CROSS EXAMINATION

By Mr. Reynolds:

Q. Bacon suggests the use of spent distillers' mash as a source of vitamins, does he not? A. Yes.

Q. Did you conduct any experiments with his process using that material? A. No. We only conducted it with the rice polish. Yes; I will say that we did use about the same proportion that Bacon did, and about the same proportion of his rice polish, as it relates to the distillers' refuse.

Q. Really, all that you have done is to vary the proportion that is suggested by Bacon, is it not? A. Well, Bacon does not suggest the relation of the ammonium salts to his molasses; and we found that, in our process, a thing we had to adjust. He does not suggest the relation of inorganic to organic nitrogen, and we found that a thing to adjust. If you mean that we did not sit down and just take up Bacon's patent and use more—as a matter of fact, if we followed Bacon's patent we never would have done this work. Crager and Timmer and all of us said no. He had used rice polish as his preferred example, and his patent said no to us. I remember that both Crager and Timmer said, "What is the use of wasting time on this? Bacon shows it only gives so much yield."

Q. But he does suggest using distillers' mash? A. Yes.

Q. And you did not try that suggestion? A. Yes. We tried distillers' mash in various amounts.

Q. Why was it not satisfactory, then? A. Well, the amount that Bacon would have used of the distillers' mash would not give you the result. When you went to more you did not get the result. We used about the amount that he would have used of the rice polish, but did not get the result, and when we said more, we used a degree more and did not get the result.

Q. Why did you not do it gradually? A. We might have done it the other way.

Q. But when you used more it was not satisfactory? A. When we used the larger more, one-half gallon of water to each gallon and a half of wort—

Q. And that was not satisfactory? A. No, sir.

Q. How much molasses did you use? A. The same amount of molasses.

Q. A gallon of molasses to a gallon and a half of mash? A. We used a hundred pounds of molasses, or a hundred grams of molasses, to a gallon and a half of wort; a hundred gallons of molasses to a gallon of wort; a hundred grams of molasses to one-half gallon of wort.

Q. And none of those was satisfactory? A. No, sir. The gallon was satisfactory. The gallon of wort was satisfactory. The gallon and a half was not and the half gallon was not.

Q. You consider that it made an invention when you proceeded in the way you did? A. Possibly so; yes.

Q. In other words, you tried a half, one and a half, and found it was not satisfactory, and then you tried one, and that is your invention? A. Yes.

Q. Simply the selection of what Bacon disclosed and what you found to be the best proportion? A. Yes. Also you will find a definite relationship between the organic and inorganic nitrogen. As I say, we used one-eighth of the ammonium salts to the molasses, and Bacon used one-sixteenth of the ammonium salts to the molasses.

Q. Are you familiar with the claims that are involved here? A. In the application?

Q. Yes. A. It has been some time since I read them over.

Q. They do not say anything about the proportion of ammonium salts, do they? A. In the claims?

Q. Yes. A. Is that right?

Q. It was known before you began that work that brewers' mash was the source of vitamin B, was it not? A. Oh, yes.

Q. And it would be evident that the more mash you used the more vitamin B you would get, other things being equal? A. Yes. The more of the mash you used you would get more; but our discovery was that when you used that more you did not get the yield, and yet out of what we used we got the vitamin potency.

Q. What you have done really is simply to effect a compromise between the vitamin content and the yield? A. We found the amount that would give us a high yield and give us a satisfactory vitamin potency. It took a lot of runs and a lot of feeding tests to find out.

Q. There is an upper limit on the amount of mash you can use, too, is there not? A. Yes.

Q. So that all amounts over 28½ per cent. are not satisfactory? A. When we added a gallon and a half of wort to a half gallon of water we got low yields, and when we cut down to a half gallon of wort to a gallon and a half of water we had a low yield.

Q. Is there anything critical about those values? There is no sudden change in those proportions, is there? A. Yes. When you use a gallon and a half of wort to a half gallon of water you get a half yield, half the yield that we got when we used a gallon of wort to a gallon of water. Conversely, when we got down to one-half gallon of wort to a gallon and half of water the yield was one-half—just automatically down.

Q. And that is the range that you considered was satisfactory; is not that true? A. Yes.

Q. But if you used slightly less than your minimum of wort there would not be any sudden change, would there? A. I think the application specifies a rather low limit, does it not, as I remember it?

Q. It gives 28½ per cent. What I mean is, 27 per cent. would not be greatly different from 28, would it? A. No.

Mr. Reynolds: That is all.

The Court: I notice you have four claims, 6, 7, 8 and 9. Are those the only claims?

Mr. Morton: Yes, sir.

The Court: Were the others abandoned before the Patent Office?

Mr. Morton: Yes, sir.

The Court: Were any of them granted?

Mr. Morton: No, sir; none were granted.

May I file a memorandum tomorrow in this case also?

The Court: Yes. And I will take it under advisement.

Mr. Reynolds: May I offer the file wrapper in this case as Defendant's Exhibit No. 1?

The Court: Yes.

(File wrapper containing Bacon patent, Examiner's statement, and decision of the Board of Appeals, was marked Defendant's Exhibit No. 1 and received in evidence.)

The Court: You may mail the memorandum to me tomorrow if you wish.

Mr. Fisher: I will give them to Mr. Lemmon, your Honor.

(Whereupon, at 12:15 o'clock p. m., the trial of the above-entitled cause was concluded.)

Feb. 9, 1937.

Yeast Run Bacon Patent.

	1	2
Molasses	631.7	631.7
Ammonium Sulphate	38.87	38.87
Magnesium Sulphate	.55	.55
Calcium Acid Phosphate	1.3	1.3
Calcium Carbonate	3.0	3.0
* Rice Polish Extract	See below.	See below.
Seed Yeast	29.15	29.15
Water (to make)	3 Gals.	3 Gals.
Temp.	80° F.	80° F.
Time	12½ hrs.	12½ hrs.
Yield (gross)	204.0 Gms	201.6 Gms.

pH of spent wort
4.5

* Rice polish extract made from 48.59 Gms. Rice polishings soaked 4½ hrs in 777.5 c.c. water at room temperature and stirred frequently. (every 15 to 20 min.) Centrifuged and extract used in above formula.

Above amounts used in each of above mixtures.

Feb. 10, 1937.

Yeast Run Bacon Patent

	1	2	3
Molasses	631.7	631.7	631.7
Ammonium Sulphate	38.87	38.87	38.87
Magnesium Sulphate	.55	.55	.55
Calcium Acid Phosphate	1.3	1.3	1.3
Calcium Carbonate	3.0	3.0	3.0
* Rice Polish Extract	See below	See below	See below
Seed Yeast	29.15	29.15	29.15
Water (to make)	3 Gal.	3 Gal.	3 Gal.
Temp.	80°F	80°F	80°F
Time	12½ hrs.	12½ hrs.	12½ hrs.
Yield (gross)	214. Gms.	202. Gms.	207. Gms.

* Rice polishing Extract made in same amounts as on page 144.

Compressed yeast from runs shown on pages 144 and 145 was dried and ground. Sent to biological laboratory.

Patented Apr. 7, 1925. 1,532,858

UNITED STATES PATENT OFFICE.

RAYMOND F. BACON, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE FLEISCHMANN COMPANY, A CORPORATION OF OHIO.

MANUFACTURE OF YEAST.

No Drawing. Application filed July 31, 1919. Serial No. 314,564.

To all whom it may concern:

Be it known that I, Raymond F. Bacon, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in the Manufacture of Yeast, of which the following is a specification.

This invention relates to the manufacture of yeast, and has for its object the provision of a novel fermentable material having such qualities that it can be used on an extensive scale for the profitable production of yeast in large quantities.

In the earlier practice yeast has generally been manufactured by introducing seed yeast into a wort, the entirety of which was obtained by first saccharifying large masses of cereals (of the maize, rye, barley and wheat class); then acidifying and filtering the material and conducting it to the fermenters where the seed yeast is introduced and the culture is carried on. The aim has merely been to produce a fluid mass containing saccharine bodies, nitrogenous materials and mineral salts, respectively, of such characters that they are available, to some extent at least, for stimulating the multiplication of yeast cells and for furnishing material for cell structure. And it has been customarily assumed that it was merely necessary to have some carbohydrates, proteids and salts present, in certain amounts, to meet the demands of the yeast, and that the maximum possibility of yeast production would be reached.

Many disadvantages are incident to this older method when followed in the manufacture of yeast in large quantities. Extensive apparatus of an expensive sort is necessary. Long periods of time are required to produce the nutrient material and thereafter effect the production of the yeast.

It has long been regarded, however, as desirable to discover a composition which could be artificially formed, synthetically, by simply mingling together ingredients which would meet the requirements of yeast culture. Such synthetic formation of the nutrient masses would obviate the necessity of extensive plants and complicated and expensive apparatus, and the time required in manufacture would be greatly reduced. And numerous compositions and various component materials have been suggested, and many methods for artificially compounding them synthetically have been proposed. For example, a composition comprising an ammonium salt, cane sugar and mineral salts, in various proportions, has been suggested. But it was established when attempting to manufacture yeast on a large commercial scale that the yield was very low from such compositions relative to that which, theoretically, they should produce. It was found that some of the materials (such as the sugar materials in the nutrient masses) must be modified; and the yield of yeast is now known to be greater where, other things being equal, sugar materials, particularly reducing sugars of the glucose or maltose class, such as molasses, are used in place of cane sugar.

It has been observed that for some reason the whole of the possible nutrients in solution was not utilized in organic growth by the yeast. I have discovered, however, that if to an artificial nutrient solution of the kind referred to above, i. e., comprising sugar material, suitable nitrogenous substances and relatively small amounts of inorganic yeast nourishing salts there be added certain other materials which carry a relatively large portion of vitamine containing substances and which have been derived from a relatively inexpensive extraneous source, the nutrient solutions which heretofore were unprofitable can be made to propagate yeast with relatively large yields at comparatively small expense. The vitamine containing materials thus added augment the vitamines originally present in the nutrient solution and would be employed in amounts sufficient to utilize synthetic nutrient solutions of this type on a commercial scale.

There are numerous classes of extraneous vitamine-containing materials which possess relatively large quantities of the vitamine substance, and of these classes there are several typical bodies that can be specified; such as "rice polish", milk, green vegetable matter (such as grass), extract of yeast, etc. Rice "polish" is obtained in large quantities when rice is being hulled and polished when preparing it for food, and it contains an abundant quantity of the vitamin substances essential for the present purpose. The same

substances are found in comparatively large quantities in the spent liquors finally escaping as waste after the fermentation caused by yeast or by other micro-organisms, and after the alcohol has been removed.

While meaning to include all of the materials possessing relatively large quantities of the vitamin substances (particularly all of those in the several classes typified by the bodies specified), I will herein, for sake of definiteness, largely refer to rice polish as a well defined and established type of the class of materials containing these substances.

The present invention will be clearly understood upon considering the following procedures, selected as examples, in the manufacture of yeast:

In a fermenting tank capable of holding, say, fifteen thousand (15,000) gallons of a fluid mass, are introduced four hundred (400) pounds of ammonium sulphate, sixty-five hundred (6500) pounds of molasses, and a comparatively large volume of water. There should also be introduced a small quantity of yeast nutrient inorganic salts, say fifty (50) pounds.

In the meantime, I have exposed five hundred (500) pounds, more or less, of rice polish to the action of one thousand (1,000) gallons, more or less, of water. They are thoroughly mixed and the mass allowed to stand for a few hours. After a period, preferably long enough to insure the extraction of the vitamin substances of the rice polish, the liquid is drawn off and filtered, if required, and then introduced into the mass above referred to in the fermenting tank. The total fluid mass in the fermenter will be one of about fourteen thousand (14,000) gallons.

Seed yeast in the usual proportion, three hundred (300) pounds, more or less, is then introduced and the process of yeast production is commenced; and with the required degree of aeration, the yeast production is carried on in the customary manner.

The effect of the addition of the vitamin substances to the nutrient is very marked. Under proper manipulation a composition such as above described (exclusive of the extract from the rice polish) should, under average conditions, produce a yield of from twenty-one hundred (2100) to twenty-eight hundred (2800) pounds of moist commercial yeast, but, with the vitamin substances added, will, under the same conditions, produce a yield from three thousand (3,000) to thirty-six hundred (3600) pounds; in the one case the yield being from thirty (30) to forty (40) percent of commercial yeast, while in the other case it is from forty-two (42) to fifty (50) percent.

Again, I have found that the initial mash mixture may comprise a small percentage of the saccharifiable cereals commonly used together with a relatively large quantity of sugar material, such as commercial molasses, and also an added amount of an ammonium salt. If the rice polish is introduced in its raw state it can be simultaneously subjected to the treatment which results in saccharifying the mash, and can thereafter be passed through the acidifying and filtering stages. Or in this case also, the vitamin extracts may be separately formed and introduced to the wort. And although the yield of yeast from a mixture, such as last specified (exclusive of the vitamin extracts) is materially enhanced because of the presence of the bodies resulting from saccharification, together with the ammonium salt and the molasses, in comparison with the amount of yeast that would result if an equivalency of cane sugar were employed, the presence of the vitamin extracts still further enhances the yield, and to a very marked extent.

Milk, skimmed or unskimmed, sweet or sour, I have found to be more or less largely charged with the vitamin substances of the character of those which I supply to the yeast. And as there are so many substances in the milk of which the yeast avails itself and as milk requires so little preparation, I generally introduce it directly into the fermenter. Whether the other ingredients are separately introduced into the fermenter and synthetically commingled or are brought there in the form of a wort derived from saccharification or similar treatment, a typical composition of this sort in the fermenter tank is as follows:

Fourteen thousand (14,000) gallons of water; four hundred (400) pounds of ammonium sulphate; sixty-five hundred (6500) pounds of molasses, small quantities of yeast nutrient inorganic salts, and one hundred (100) pounds of milk solids. Here the yield of yeast is remarkably high, it rising from twenty-one (21) to twenty-eight (28) hundred pounds up to three thousand (3000) to thirty-two hundred (3200) pounds when the procedure is carried on properly. While I am not at this time able to state in detail all the relations of causes and effects which are present, I have discovered that the abundant supply of vitamin substances is the main reason why the yeast organisms are powerfully stimulated in that they multiply rapidly and exhaust almost to the theoretical limit the possibilities of yeast cell multiplication, and is the cause of the production of a remarkably strong and durable cell structure.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In the art of yeast manufacture, the process of producing yeast which comprises

preparing a yeast nutrient solution containing sugar material and yeast nourishing inorganic salts, propagating yeast therein with aeration, and adding extraneous vitamine-containing material, in amounts sufficient to produce high percentage yields of yeast relative to the amounts of sugar and salt nutrients employed.

2. In the art of yeast manufacture, the process of producing yeast which comprises preparing a yeast nutrient solution containing essentially molasses and yeast nourishing inorganic salts, propagating yeast therein with aeration, and augmenting the vitamines initially present by adding a predetermined amount of extraneous vitamine-containing material, whereby relatively high percentage yields from the nutrient materials employed are obtained.

3. In the art of manufacturing bakers' yeast, the process which comprises preparing a yeast nutrient solution containing molasses, and an ammonium salt, propagating yeast therein with aeration, and augmenting the vitamine substances originally present by adding a quantity of extraneous vitamine-containing material, whereby the yeast growth uses a relatively high percentage of the nutrients supplied, resulting in high yields of yeast.

In testimony whereof, I affix my signature.

RAYMOND F. BACON.

UNITED STATES
COURT OF APPEALS FOR THE
DISTRICT OF COLUMBIA

FILED OCT 15 1942

Joseph W. Stewart

CLERK

BRIEF FOR APPELLEE

In the United States Court of Appeals for the District of Columbia

APPEAL NO. 8252

ROBERT M. ALLEN, FRIEDRICH ERNST TIMMER, AND
VEGEX INCORPORATED, APPELLANTS

v.

CONWAY P. COE, COMMISSIONER OF PATENTS, APPELLEE

APPEAL FROM THE JUDGMENT OF THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF COLUMBIA

W. W. COCHRAN,
Solicitor, United States Patent Office, Washington, D. C.
Attorney for Appellee.

E. L. REYNOLDS,
Of Counsel.

October 1942.

INDEX

Page
Introduction ---- 1
Appellants' Application ---- 1
The Bacon Patent ---- 2
Appealed Claims ---- 2
Summary of Argument ---- 2
Argument ---- 3
Conclusion ---- 6
Authorities cited:
  Brady Brass Co. v. *Ajax,* 160 F. 84 ---- 3
  Carbide and Carbon Chemicals Corp. v. *Texas Co.,* 21 F. (2d) 199 ---- 3
  David Belais v. *Goldsmith Bros.,* 10 F. (2d) 673 ---- 3
  E. I. du Pont de Nemours Co. v *Glidden Co.,* 1 F. S. 1007 ---- 4

In the United States Court of Appeals for the District of Columbia

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Appeal No. 8252

Robert M. Allen, Friedrich Ernst Timmer, and Vegex Incorporated, appellants

v.

Conway P. Coe, Commissioner of Patents, appellee

APPEAL FROM THE JUDGMENT OF THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF COLUMBIA

BRIEF FOR THE COMMISSIONER OF PATENTS

INTRODUCTION

This is an appeal from the judgment of the District Court of the United States for the District of Columbia (8)[1] dismissing appellants' complaint brought under Section 4915 R. S. (U. S. C. Title 35, Sec. 63) to authorize the Commissioner of Patents to issue to appellants a patent containing claims 6, 7, 8 and 9 of the application of Robert M. Allen and Friedrich Ernst Timmer, Serial No. 4520.

APPELLANTS' APPLICATION

The application here involved (10) discloses a method of producing yeast high in vitamin B content and pellagra prevention factor, in which the yeast is grown on a wort containing 28.5% or more of spent distiller's grain mash from which the alcohol has been extracted.

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[1] Note.—The numbers in parentheses indicate pages in appellants' appendix.

THE BACON PATENT

The patent to Bacon (39) discloses a process of growing yeast in a wort to which a vitamin containing material has been added. Among the materials suggested are rice polish and distiller's grain mash from which the alcohol has been extracted. The amount of rice polish which it is proposed to use amounts to about seven percent of the total wort. There is no specific example given of the use of distiller's mash, but since this material is suggested as a substitute for rice polish, it is a reasonable inference that about the same amount of it is to be used.

APPEALED CLAIMS

The appealed claims are found on pages 2 and 3 of appellants' appendix.

SUMMARY OF ARGUMENT

1. The Bacon patent discloses the entire process claimed except for the specific amount of grain mash used.
2. The amount of grain mash claimed is not critical. The results of varying this amount were well understood and the appellants have merely selected by experiment the amount which they consider best suited to their needs.

ARGUMENT

It is thought to be clear that, aside from the exact amount of grain mash used, Bacon discloses everything claimed here. The fourth finding of fact of the Court below was that "The claims involved in this action differ from the process disclosed by Bacon only in the amount of distiller's mash employed." In appellants' brief (page 12) issue is taken with this finding, but only on the ground that Bacon "discloses no specific amount of distiller's mash." It is not denied that all other elements are disclosed. Accordingly, it is solely the particular amount of mash which is relied on as rendering the claims patentable.

Whether Bacon's disclosure as to grain mash is that about seven percent of it should be used (by analogy with the rice polish which it replaces) or whether, as appellants contend, he discloses no definite amount of mash, is thought to be immaterial. It is quite clear that he suggests that this material may be used, and this is not denied by the appellants. The disclosure of the use of mash is found in the sentence beginning in the last line on page 1 of the patent. The sole question to be decided, therefore, is whether, given the suggestion of using this mash, it required invention to determine that the particular proportion of this material set forth in the claims should be used.

It is well settled that changes in proportions of ingredients are not patentable if they result in changes in degree only and do not produce any new or unexpected result (*David Belais* v. *Goldsmith Bros.,* 10 F. (2d) 673; *Brady Brass Co.* v. *Ajax,* 160 F. 84; *Car-*

bide and Carbon Chemicals Corp. v. *Texas Co.,* 21 F. (2d) 199; *E. I. du Pont de Nemours Co.* v. *Glidden Co.,* 1 F. S. 1007). It is only where a particular range is critical that it affords a proper basis for the grant of a patent.

The exact amount of mash to be used in carrying out Bacon's suggestion would obviously be a matter for experimental determination. Anyone attempting to use the process would try various amounts and select the one giving the best result. It is thought to be evident from the testimony of Dr. Allen on cross-examination (33–36) that this is all that was done by him and Timmer in the making of the alleged invention claimed here. The witness admitted that they were familiar with the Bacon patent when they began their work, and that they tried various proportions before they found what they considered the best one. He also admitted (35) that it was known in the art that grain mash was a source of vitamin B and that the more mash was used, the higher would be the vitamin B content of the product. His testimony as to what was done is well summed up in the following quotation (35):

> The more mash you used, you would get more (vitamin B); but our discovery was that when you used that more you did not get the yield, and yet out of what we used we got the vitamin potency * * *. We found the amount that would give us a high yield and give us a satisfactory vitamin potency. It took a lot of runs and a lot of feeding tests to find out.

In other words, the appellants, who were attempting to produce a yeast high in vitamin B started with Bacon's teaching that grain mash could be used in the wort and the knowledge that it would produce vitamin B in the yeast. In carrying out this teaching they would naturally attempt to use as much mash as possible, but it was found that, if too much were used, the yield was decreased. They, accordingly, effected a compromise by selecting the proportion which would give the highest vitamin content consistent with a satisfactory yield. This procedure involves nothing more than conventional laboratory technique. The result achieved was not unexpected but, on the contrary, was exactly what should have been anticipated. It was known that grain mash was a source of vitamin B and the appellants merely found that the use of a large amount of mash resulted in a large amount of vitamin B.

There is no evidence whatever to indicate that the particular proportions claimed are critical, or that any sudden or unexpected change takes place at the point specified in the claims. On the contrary, Dr. Allen testified (36) that the effect of using 27% of mash would not be materially different from that of using 28%. The appellants have merely adopted the proportion of Bacon's ingredients which they have found to be best suited to their purpose.

It is to be noted, moreover, that the claims do not fix a definite proportion, but merely specify the lower limit of the mash to be used without specifying any upper limit. It is quite clear that all amounts of mash over the limit specified would not give satisfactory results and this was expressly conceded by Dr. Allen (35). Accordingly, the claims do not even define the range whose discovery is alleged to have involved invention, but seek to appropriate all amounts of mash above a certain minimum, whether they are suitable for the appellants' purpose or not. Since the range specified includes unsatisfactory, as well as satisfactory, proportions it clearly does not constitute such a definition of invention over Bacon as would warrant the allowance of the claims.

CONCLUSION

It is submitted that the claims call for nothing more than the experimental determination of the proportioning of Bacon's ingredients best suited to appellants' purpose, that no critical proportioning was discovered or defined in the claims and that the Court below properly held the claims unpatentable.

Respectfully submitted,

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United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA

No. 8252

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ROBERT M. ALLEN, FRIEDRICH ERNST TIMMER and VEGEX, INCORPORATED,
Appellants,

vs.

CONWAY P. COE, Commissioner of Patents,
Appellee.

PETITION FOR REHEARING.

The appellants respectfully petition for rehearing in the above case with respect to that portion of the decision which deals with the Bacon patent, for the reason that appellants are convinced that the Court, in considering the Bacon patent, failed to take into consideration the entire Bacon disclosure.

It is of course too well settled for citation of authority that in construing a patent, like any other instrument, the entire contents must be considered.

> *Goodyear Dental Vulcanite Co.* v. *Davis,* 102 U. S. 222;
> *Hogg* v. *Emerson,* 6 How. 437;
> *National Hollow Brake-Beam Co.* v. *Interchangeable Brake-Beam Co.,* 106 Fed. 693.

The question with regard to any citation from the prior art is what does that publication disclose to the man skilled in the art? Had the Bacon patent stated merely that the patentee "used the spent mash for increasing the yield of yeast" (Opinion, p. 2) the patent might be regarded as perhaps suggesting the experimentation which led to the appellants' invention, but Bacon did not stop there. Instead he gives in his patent the yields obtained, and these yields, which Bacon apparently regarded as high yields, are so far below the yields that were obtained in everyday yeast manufacture at the time of filing the application before the Court as to render the Bacon process worthless for the *sole* purpose stated, namely, producing *large* yields.

The patent *as a whole* taught the prior art at the time of the application for the patent in suit that a molasses-mineral salts mash to which the Bacon formula was added gave yields much *smaller* than those obtained from the molasses-mineral salts mash *without* the Bacon formula. Hence the worker in the art familiar with the Bacon patent would be led *away* from the process developed by the appellants, rather than toward it. The development in yeast manufacture in the interval between the application for the Bacon patent and the application here in suit is parallel with the development in the airplane industry. An applicant for an airplane patent in 1918 might very well say: "I have invented a way to increase the speed of airplanes. By my invention the plane attains a speed of 150 miles an hour". An airplane designer twenty years later would certainly not consider adopting any measure whose claim to utility was based on giving the plane a speed of 150 miles an hour.

The appellants are not asking a rehearing with respect to the Court's ruling that the claims are too broad as not containing a limitation of maximum as well as minimum percentage of extract. Any objection to the wording of the claims can be cured by filing a continuing application just as a patent, once granted, may be reissued to narrow claims which are too broad. The Court's ruling, however, that the process disclosed no invention over the Bacon patent precludes the filing of a more limited continuing application.

Respectfully,

W. B. MORTON,
Attorney for Appellants.

Dated: New York, N. Y.,
April 19, 1943

Certificate.

I certify that this petition for rehearing, in my opinion, is well founded in law and fact, and is not filed for purposes of delay.

W. B. MORTON,
Attorney for Appellants.